was irradiated receiving 50,4 Gy. The comorbidities associated were: 21% diabetes, 62,5% High blood pressure, 40% cardiac pathology and 33 % were with anticoagulant treatment. All our haematuria patients have been handled following the next algorithm: Blood Test (Including platelets and liver parameters) and Urine Culture. If both are negative: Ultrasound (Kydney, urether and bladder). If haematuria goes on: Cystoscopy.

Results: With a median follow-up of 52.5 months (range 5-122 m), 48 patients (13%) have had haematuria. As etiological factors we have been found: Urine Infection 12 p (25%. Time 32 months (12-70 m), Bladder cáncer 10 p (21%. Four of them a recurrence of a previous treated bladder tumour. Time: 32 months (3-120 m), RADIATION CYSTITIS 10 p (21%. Time: 13 months (6 – 38 m), Lithiasis 4 p (8%. Time: 25.5 months (26-30 m), Local progression of Prostate cancer 1 p (2%). Time: 72 months), Autolimited haematuria (Culture and image studies negatives. It does not repeat.): 9 p (19%. Time: 58 months (25-80 m) and Fatal haematuria (Exitus. Not known etiology): 2 p (4%. Time: 78 and 84 months).

Conclusion: In our experience, haematuria is a frecuent pathology in patients treated with radiotherapy of prostate cancer. The etiology of it spreading in similar proportions, across the different causes founded. The time of it presentation is important for the diagnostic. In the mind of the specialist must be different causes of it, NOT ONLY radiotherapy Cystitis taking in account that if it is due to radiotherapy it appears mainly, in the first two years after radiotherapy treatment.

EP-1339

Influence of leaf thickness on prostate VMAT about dosimeto-volumetoric and delivering parameters

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Purpose or Objective: Volumetric modulated arc therapy (VMAT), a complex treatment strategy for intensity-modulated radiation therapy, has been established clinically. While 5 mm thick MLC (**L50**) is a usual for VMAT, we have been using 2.5 mm thick MLC (**L25**) from 2012 to treat the prostate cancer. So we compared dosimetric, volumetric and dose delivering parameters between **L25** and **L50**.

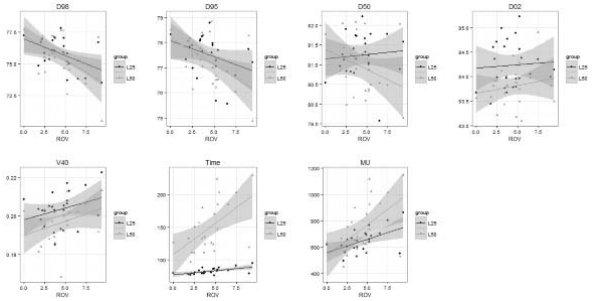
Material and Methods: Twenty four cases were selected from our database. Those patients were treated for the prostate carcinoma in the feet-first prone position. Gantry angle range was 182 deg. to 178 deg. and collimation angle was set 0 deg. SmartArc system of Pinnacle3 was used with 6MVX physical data of Novalis Tx (**L25**) and 6MVX Siemens® ARTISTE physical data loaded on Varian Clinac-21 Ex (the base machine of Novalis) virtually (**L50**). The same consolidations for optimization were used. For example, Min Dose, D95 and Max Dose of PTV were 76 Gy, 80 Gy and 84 Gy, respectively. Rectal V40 was set to 20%. Wilcoxon rank sum test was applied to D98, D95, D50 and D02 of PTV, rectal V40, irradiation time and MU. To analyze relationships between these values and ROV grouped by **L25** or **L50**, linear regression model was employed with analysis of covariance for the regression coefficients.

Results: Mean values of D98, D95, D50 and D02, V40, Time and MU were 75.8 Gy, 77.5 Gy, 81.2 Gy, 84.2 Gy, 20.3%, 82.7 sec and 646.6 for **L25**, and were 75.6 Gy, 77.3 Gy, 81.0 Gy, 83.8 Gy, 19.6 %, 149.9 sec and 741.6 for **L50**, respectively. Only those mean values of D02, V40 and Time were significantly different between **L25** and **L50** by Wilcoxon test (Table).

Table p values of statistical analyses

Variables	Wilcoxon rank sum test (L25/L50)	Analysis of covariance for the regression coefficients		
		ROV	L25/L50	ROV*L25/L50
D98	NC	<0.001	NC	NC
D95	NC	<0.01	NC	NC
D50	NC	NC	NC	NC
D02	<0.01	NC	<0.01	NC
V40	<0.05	<0.05	<0.05	NC
Time	<0.001	<0.01	<0.001	<0.05
MU	NC	<0.001	<0.05	NC

D98, D95, V40, Time and MU depended on ROV significantly. Slopes of valuables grouped by **L25** and **L50** were very similar in the all except Time and MU (Table and Figure).



Conclusion: L25 and **L50** plans were very similar from the dosimetric point of view (difference of D02 was significant but very small in value; 0.4Gy, **L25**>**L50**). From the volumetric (V40) point of view, difference was small (0.7%, **L25**>**L50**) but significant. In terms of dose delivery (Time), differences were remarkable and largely depend on the ROV especially in the cases of **L50**. We may use **L50** with the expense of treatment time compared to **L25**.

EP-1340

Nomograms predicting the probabilities of having indications for adjuvant prostatic radiotherapy

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Purpose or Objective: For patients with clinically localized prostate cancer with high probabilities to undergo adjuvant radiotherapy after radical prostatectomy(RP), radical radiotherapy may be a proper treatment option for saving time and medical costs. Our purpose is to develop nomograms combining PSA level, clinical T stage, and biopsy Gleason Score to predict probabilities of having indications for adjuvant radiotherapy including extraprostatic extension, positive margin, Gleason Score 8-10 and to provide data for individualizing initial treatment options.

Material and Methods: We analyzed 214 men treated with RP between August 2013 and August 2015 at our hospital. Average age was 66 years. Men who enrolled in this study had a preoperative PSA level assessed before or at least 4 weeks after prostate biopsy, biopsy Gleason Score, pelvic MRI and clinical T stage (TNM 2009 classification). Men were excluded for preoperative treatment with neoadjuvant hormonal therapy, or transurethral resection of the prostate because of potential influence on pathologic stage or PSA level. Preoperative predictors included PSA level, clinical T stage (T2a/b, T2c, T3a, T3b), and biopsy Gleason score (5-6, 3+4=7, 4+3=7, 8-10). These predictors were used in multivariable logistic regression analysis based nomograms to estimate the probabilities of extraprostatic extension, positive margin, Gleason Score 8-10 after RP, respectively. The predictive accuracy and discriminative ability of the

nomogram were determined by concordance index(C-index) and calibration curve.

Results: 47% of the patients had extraprostatic extension, 36% had positive margin, and 20% had Gleason Score 8-10. Nomograms were developed for the predicted probabilities of having the indications of adjuvant radiation therapy(Fig1ABC). The calibration curve for probabilities showed good agreement between prediction by nomogram and actual observation (Fig 1DEF). The C-index of the nomograms for predicting extraprostatic extension disease, positive margin, and Gleason Score 8-10 were 0.799, 0.746, 0.879, respectively. The risk of having one of the indications of adjuvant radiation therapy increased with increases in predictors except for T stage for predicting Gleason Score 8-10(p=0.25).

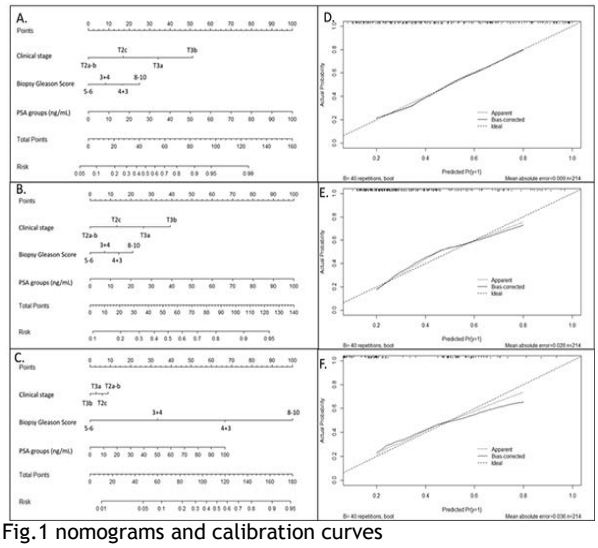

Fig.1 nomograms and calibration curves

Conclusion: We produced nomograms that may accurately predict the probabilities of having indications for adjuvant radiation therapy after RP in men with localized prostate cancer, which may contributes to properly selecting initial treatment option.

EP-1341

Single-nucleotide polymorphisms associated with toxicity to radiotherapy in prostate cancer patients

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Purpose or Objective: Together with surgery, radiotherapy (RT) is a cornerstone in the treatment of prostate cancer. Despite similar prognostic factors, a wide inter-patient variability was observed in tumour response and side effects. Many studies have been made to understand molecular behaviour of tumours exposed to ionizing radiation. It has been hypothesized that single-nucleotide polymorphisms (SNPs) impact response and adverse reactions for patients (pts) receiving RT. We focused on the analysis of some candidate SNPs in pts treated with RT for prostate cancer.

Material and Methods: Between January and September 2014, 66 pts with prostate cancer underwent RT with radical or adjuvant intent. RT was delivered using 4-6 coplanar 10-18 MV beams at a dose of 70-80 Gy (2.5-2 Gy/fraction). At baseline and weekly during treatment, acute gastrointestinal (GI) and genitourinary (GU) toxicities were scored by a fixed questionnaire. The RTOG toxicity scale served as a basis, but additional symptoms were evaluated as well. Genotyping was performed from whole blood samples at the beginning of RT. DNA was purified with the QIAamp DNA Mini Kit. Assays of samples were performed using the "Radiotherapy response" kit (Diatech Pharmacogenetics, Italy). Pyrosequencing analysis was carried on the PyroMark Q96 ID (Biotage, Sweden). Status of candidate SNPs (GSTP1 A313G, RAD51 G135C, XRCC1 G28152A, XRCC3 A4541G and XRCC3 C18067T) was unknown to interviewers and participants.

Results: Treatments were delivered successfully without any interruption. Grade 1, Grade 2 and Grade 3 GI toxicities were observed in 33%, 12% and 3% of the pts, respectively, during the whole period. Grade 1, Grade 2 and Grade 3 GU toxicities were seen in 50%, 32% and 15% of the pts. Eight items of GI toxicity and six items of GU toxicity were used to calculate, for each patient, his own toxicity score. Time of onset of side effects was taken into account too. Using R statistical program, no significant relation was found between total toxicity or precocity of side effects and the mutational status of our 5 candidate loci, except for GSTP1 and toxicity. Kruskal-Wallis test demonstrated that GSTP1 status (wild-type, heterozygous and mutant) is a strong predictor of GI effects, especially diarrhea (p=0.01), frequency of stools (p=0.01), incontinence (p=0.01) and rectal blood loss (p=0.02).

Conclusion: Overall, RT is a well tolerated therapy for prostate cancer. Five SNPs were analyzed in four genes of relevance for RT. GSTP1 showed to be the most important SNP regarding GI toxicity to RT in pts treated for prostate cancer. Other examined SNPs did not prove to play a significant role in this particular subset of pts. Our findings require validation in larger replication studies and open to future clinical trials. One of the next steps will be evaluate if GSPT1 is associated with response to RT too. This would permit personalization and optimization of RT for each prostate cancer patient.

EP-1342

F-18Fluorcholine-PET/CT guide salvage therapy in biochemical failure of prostate cancer

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Purpose or Objective: To describe the F-18Fluorocholine PET/CT (cPET/TC) activity after biochemical failure in localized prostate cancer. To analyze the response to cPET/TC-guided salvage therapy.

Material and Methods: N: 80 patients(p) with cPET/TC between 2006-2012, 64p at time of biochemical failure.
At diagnosis 15p T1 (18.5%), 37p T2 (46.4%), 23p T3 (28.8%) and 5p T4 (6.3%). N0 (87.5%). Gleason score: 6: 30p (37.6%), 7: 27p (33.8%),≥ 8: 20p (25.1%), missing: 3p (3.8%). Baseline median PSA 9.0 ng/ml. [0.9-114.5]
Initial treatment: 45p (56.4%) prostatectomy, 13p (16.3%) radiotherapy and hormones 2.5 years, 11p (13.8%) radiotherapy and hormones 6 months, 7p (8.8%) radiotherapy alone and 4p (5%) had hormones alone.
cPET/TC -guided salvage treatments were: 23 radiotherapy (36%), 2 brachytherapy (3.1%), 8 radiotherapy and hormones (12.5%), 29 hormones (45.3%), 1 chemotherapy (1.6%) and 1 radical protatectomy (1.6%).

Results: Median time from diagnosis to cPET/TC failure: 44.03 months [2.37-126.83]. Median PSA values were 1.69 ng/ml [0.1-70.6].
cPET/TC local failure(LF) occurred in 39p (60.9%), nodal failure(NF) in 15p (23.4%) and metastasic failure(MF) in 10p (15.6%).
With a median follow up of 55 m after rescue treatment, 15p (23.4%) had biochemical failure again. At 5 years biochemical relapse free survival (BRFS) was 65%. Overall survival 5y: 91% (median: 119 months).
BRFS was 59% without LF vs 83% with LF (p 0.26)
BRFS was 75% without NF vs 30% with NF (p 0.065)